

What is claimed is:

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1. An instrument comprising:
 - (a) an enclosure having an opening through which a fluid can flow;
 - (b) first and second differential pressure switches; and
 - (c) a sealed chamber in said opening, said chamber having an outlet and comprising:
 - (i) first and second restrictors through which said fluid can flow; and
 - (ii) means for transferring the pressure in said sealed chamber to said first and second differential pressure switches, the pressure in said enclosure to said first switch and the pressure at said sealed chamber outlet to said second switch.

2. The instrument of claim 1 wherein said first and second differential pressure switches are inside said enclosure.

3. The instrument of claim 1 wherein said means for transferring said pressure in said sealed chamber to said differential pressure switches is a tube.

4. The instrument of claim 1 wherein said means for transferring said pressure is a first tube [for transferring said pressure in said chamber to switches], a second tube [for transferring said enclosure pressure to said first switch] and a third tube^{NPR} [for transferring said sealed chamber outlet pressure to said second switch].

5. The instrument of claim 3 wherein said first and second differential pressure switches are inside said enclosure and said means for transferring said pressure is a first tube [for transferring said pressure in said chamber to said switches], a second tube [for transferring said enclosure pressure to said first switch] and a third tube^{NPR} for [transferring sealed chamber outlet pressure to

said second switch.

6. The instrument of claim 1 wherein said first and second differential pressure switches are connected in series

7. The instrument of claim 1 wherein said sealed chamber outlet is threaded for attachment to [an ^{NPR} outlet pipe].

8. The instrument of claim 1 wherein said sealed chamber outlet vents to atmosphere and said sealed chamber outlet pressure is the pressure of said atmosphere.

9. The instrument of claim 1 wherein each of said first and second differential pressure switches have a predetermined actuation pressure and each of said first and second restrictors have a resistance to flow selected so that the pressure drop across said first restrictor for a given rate of fluid flow through said first restrictor matches the predetermined actuation pressure of said first switch and the pressure drop across said second restrictor for a given rate of fluid flow through said second restrictor matches the predetermined actuation pressure of said second switch.

10. The instrument of claim 1 wherein each of said first and second differential pressure switches have a settable actuation pressure and said first pressure switch settable actuation pressure is set to match the pressure drop through said first restrictor for a given rate of fluid flow through said first restrictor and said second pressure switch settable actuation pressure is set to match the pressure drop through said second restrictor for a given rate of fluid flow through said second restrictor.

11. A flow sensor for use in an instrument comprising:

(a) first and second differential pressure switches;

(b) a sealed chamber comprising:

- (i) an inlet and an outlet through which a fluid can flow;
- (ii) a flow restrictor²² in said inlet and a flow restrictor²⁴ in said outlet; and
- (iii) means³⁴ for transferring the pressure in said sealed chamber to said first and second differential pressure switches.

12. The flow sensor of claim 11 further comprising means³⁶ for transferring the pressure in an enclosure of said instrument when said flow sensor is inserted in said enclosure to said first switch and means²¹ for transferring the pressure at said sealed chamber outlet to said second switch.

13. The flow sensor of claim 12 wherein all of said means for transferring pressure are tubes.

14. The flow sensor of claim 11 wherein said first and second differential pressure switches are connected in series.

15. The flow sensor of claim 11 wherein said sealed chamber outlet is threaded for attachment to an outlet pipe.

16. A flow sensor for use in an instrument comprising:

a sealed chamber comprising:

- (i) an inlet and an outlet through which a fluid can flow;
- (ii) a flow restrictor in said inlet and a flow restrictor in said outlet; and
- (iii) means for transferring the pressure in said sealed chamber to first and second differential pressure switches.

17. The flow sensor of claim 16 wherein said sealed chamber outlet is threaded for attachment to an outlet pipe.

18. The flow sensor of claim 16 further comprising

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first and second differential pressure switches.

19. In combination:

(A) an instrument comprising an enclosure having an opening through which a fluid can flow;

(B) a flow sensor comprising:

(i) first and second differential pressure switches; and

(ii) a sealed chamber in said opening, said chamber having an outlet and comprising:

(a) first and second restrictors through which said fluid can flow; and

(b) means for transferring the pressure in said sealed chamber to said first and second differential pressure switches, the pressure in said enclosure to said first switch and the pressure at said sealed chamber outlet to said second switch.

20. The combination of claim 19 wherein said instrument is an analytical instrument.

21. The combination of claim 19 wherein said first and second differential pressure switches are connected in series.

22. The combination of claim 19 wherein said sealed chamber outlet is threaded for attachment to an outlet pipe.

23. The combination of claim 19 wherein said sealed chamber outlet vents to atmosphere and said sealed chamber outlet pressure is the pressure of said atmosphere.

24. The combination of claim 19 wherein each of said first and second differential pressure switches have a predetermined actuation pressure and each of said first and second restrictors have a resistance to flow selected so that the pressure drop across said first restrictor for a given rate of fluid flow through said first restrictor matches the predetermined actuation pressure

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of said first switch and the pressure drop across said second restrictor for a given rate of fluid flow through said second restrictor matches the predetermined actuation pressure of said second switch.

25. The combination of claim 19 wherein each of said first and second differential pressure switches have a settable actuation pressure and said first pressure switch settable actuation pressure is set to match the pressure drop through said first restrictor for a given rate of fluid flow through said first restrictor and said second pressure switch settable actuation pressure is set to match the pressure drop through said second restrictor for a given rate of fluid flow through said second restrictor.

26. An instrument comprising:

(a) an enclosure having an opening through which a fluid can flow;

(b) a first pressure transducer in said enclosure and a second pressure transducer outside of said enclosure;

(c) a sealed chamber in said opening, said chamber having an outlet and comprising:

(i) first and second flow restrictors through which said fluid can flow;

(ii) means for transferring the pressure in said sealed chamber to said first and second pressure transducers; and

(d) means connected to said first and second pressure transducers for calculating for any given rate of flow of said fluid through said sealed chamber the flow through said outlet.

27. The instrument of claim 26 wherein said means for transferring said sealed chamber pressure to said first and second pressure transducers is a tube.

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